

REMARKS

Applicants respectfully request entry of the amendments and remarks submitted herein. Claims 1 and 14 have been amended herein, and claims 17-19 and 21 have been canceled herein without prejudice to continued prosecution.

Claims 1-16 and 20 are currently pending. Reconsideration of the pending application is respectfully requested.

The 35 U.S.C. §112 Rejections

Claims 17-19 and 21 stand rejected under 35 U.S.C. §112, second paragraph, because, according to the Examiner, since the claim does not set forth any steps involved in the method/process, it is unclear what applicant is intending to encompass.

Without acquiescing to the Examiner's rejection, claims 17-19 and 21 have been canceled herein without prejudice to continued prosecution. Therefore, Applicants submit that the rejection of these claims under 35 U.S.C. §112 is moot.

The 35 U.S.C. §101 Rejections

Claims 17-19 and 21 stand rejected under 35 U.S.C. §101 because, according to the Examiner, the claimed recitation of a use, without setting forth any steps involved in the process, results in a claim which is not a proper process claim under 35 U.S.C. §101.

Without acquiescing to the Examiner's rejection, claims 17-19 and 21 have been canceled herein without prejudice to continued prosecution. Therefore, Applicants submit that the rejection of these claims under 35 U.S.C. §101 is moot.

The 35 U.S.C. §102 and 35 U.S.C. §103 Rejections

Claims 1-18, 20 and 21 stand rejected under 35 U.S.C. §102(b) or under 35 U.S.C. §103(a) as being anticipated by, or unpatentable over, Idaszak (US Patent No. 4,021,927, hereafter "the '927 patent"). Specifically with respect to independent claims 1 and 14, the Examiner asserted that Idaszak discloses methods for modifying starch or starch derivatives using the claimed methods. These rejections are respectfully traversed.

The '927 patent describes a fluidization process which involves passing a substrate through a number of discrete elements: an upper, agitated fluidized zone and a lower, agitated fluidized zone, with an intermediate fluidized zone formed of a plurality of tubular zones communicating with each of the upper and lower fluidized zones whereby fluidizing gas is passed upwardly through the lower, agitated fluidized zone, through the intermediate zone and into the upper, agitated fluidized zone to fluidize the solids in each of the three zones (see, for example, column 3, lines 11-20). According to the '927 patent, the starch is preferably introduced into an upper fluidized zone and is continuously agitated in that upper fluidized zone (see, for example, column 3, lines 58-60). From the upper fluidized zone, the starch is passed downward counter-currently with the fluidizing gas through the plurality of tubular fluidized zones into the lower fluidized zone that is likewise agitated (see, for example, column 3, lines 60-64). The product formed is removed from the lower fluidized zone (see, for example, column 3, lines 3 and 64-65). One of the important features of the process disclosed in the '927 patent is that both the upper and lower fluidized zones are vigorously agitated to ensure complete mixing in both the upper and lower zones (see, for example, column 3, line 66 through column 4, line 1). The agitation not only serves to prevent channeling, which thus avoids incomplete conversion of the starch, but also serves to prevent dead zones in the reaction vessel (see, for example, column 4, lines 1-5).

Figure 1 of the '927 patent shows an embodiment of their fluidized bed reactor. Figure 1 of the '927 patent shows a fluidized reactor that includes an elongate vertical housing 10 that defines an upper chamber 12 having inlet means 14 to supply the starch (see, for example, column 5, lines 50-53) and a lower chamber 16 (see, for example, column 5, lines 53-55). According to the '927 patent, both the upper chamber 12 and the lower chamber 16 include agitator means 18 and 20, respectively (see, for example, column 5, lines 55-57). The agitator means 18 and 20 include a shaft 22 and 26 mounted for rotation within the upper chamber 12 or lower chamber 16, respectively, wherein the shaft is provided with a plurality of impellers that can be in the form of flat paddles (see, for example, column 5, lines 57-61). As shown in Figure 1 in the '927 patent, there is an agitator comprising a paddled rotatable shaft in each of the upper chamber and the lower chamber. After the starch has been agitated in the upper chamber, gravity pulls the starch down through the tubes [of the intermediate section] into the lower chamber (see,

for example, column 7, lines 25-30). Thus, the reactor in the '927 patent does not have a tubular body comprising a rotating shaft upon which is disposed one or a plurality of blades which convey the starch substrate from an inlet at one end of the reactor to an outlet at the other end of the reactor as Applicants' independent claims now require.

The particularly claimed methods provide a number of advantages over other methods used in the art, which are discussed on page 8 of Applicants' specification. For example, as a consequence of the combined effect of the rotation of the integral rotating shaft with one or more blades and the counter-current flow of gas, the starch substrate is subjected to increased turbulence in the reactor than other methods used to modify starch or starch derivatives. The increased turbulence causes an increase in the frequency with which the individual particles of the starch substrate come into contact with, for example, the heated reactor wall, thus leading to a more homogeneous reaction. In addition, because the frequency with which the starch particles contact the heated reactor wall increases, the particle temperature rises quickly. This results in an accelerated rate of reaction and a reduction in reaction time, which reduces costs and increases the reaction efficiency. Further, the counter-current flow of gas combined with the rotation of the integral rotating shaft with one or more blades provides an efficient method of transporting reactants through the reactor while maintaining substrate particles in a fluidized state (e.g., preventing the particles from settling and/or sticking to the reactor wall).

There is no disclosure in the '927 patent that would prompt one of ordinary skill in the art to convey the starch substrate from the inlet to the outlet using one or more blades provided on a rotating shaft, and there is no disclosure in the '927 patent that suggests that conveying the starch through the reactor in the claimed manner would result in the disclosed advantages. Claims 1 and 14 as amended are novel and non-obvious over the '927 patent for at least the reasons stated herein. In view of the amendments and remarks herein, Applicants respectfully request that the rejection of the pending claims under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) be withdrawn.

CONCLUSION

Applicants respectfully request allowance of claims 1-16 and 20. Please apply any charges or credits to Deposit Account No. 06-1050.

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